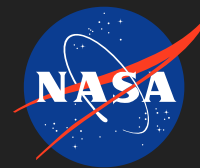


# Radiation-Tolerant Reprogrammable FPGA for Digital Signal Processing Circuits, Phase I

Completed Technology Project (2008 - 2008)



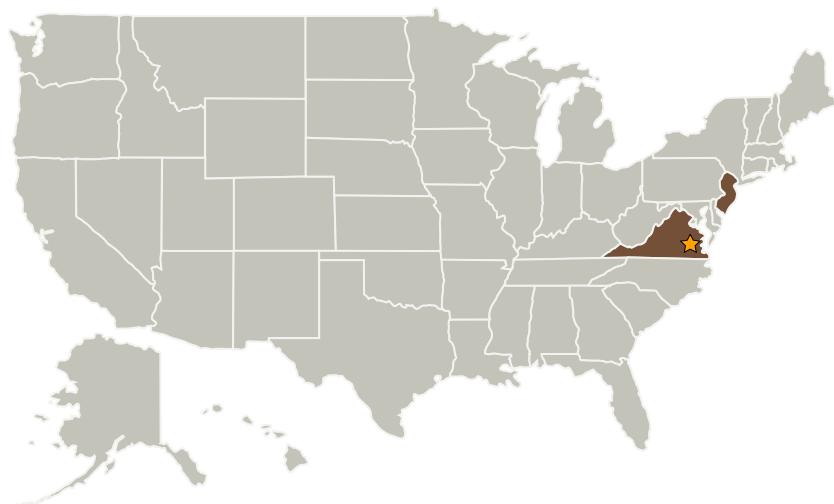
## Project Introduction

Field Programmable Gate Arrays are a widely used technology; however, they are generally limited in reprogrammability. Radiation hard, low power and high density ReProgrammable FPGAs (RP-FPGAs) would be a tremendous asset in long duration missions. The ability to adapt to changing mission profiles and on board capabilities is highly desirable. We herein propose to develop a RP-FPGA for flight use. In Phase I we will prove basic device concepts working with a leading FPGA manufacturer. In Phase II we will develop a viable demonstration prototype that will enable routine Phase III device manufacture.

## Anticipated Benefits

Potential NASA Commercial Applications: FPGAs serve a wide range of applications as an alternative to ASICs. Highly desirable is a FPGA that could be reprogrammed. Product revisions are often constrained by past programmed logic or suffer from extra cost as programmed arrays must be replaced. A reprogrammable gate array would be a significant benefit to product designers and enable a new form of product upgrade to be easily carried out - hence offering opportunity to gain a significant market share.

## Primary U.S. Work Locations and Key Partners



Radiation-Tolerant  
Reprogrammable FPGA for  
Digital Signal Processing  
Circuits, Phase I

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Structured Materials Industries, Inc.	Supporting Organization	Industry	Piscataway, New Jersey

Primary U.S. Work Locations	
New Jersey	Virginia

## Project Transitions

**January 2008:** Project Start

**July 2008:** Closed out

**Closeout Summary:** Radiation-Tolerant Reprogrammable FPGA for Digital Signal Processing Circuits, Phase I Project Image

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

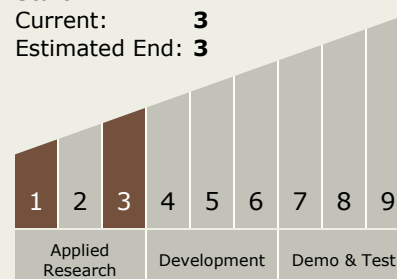
Carlos Torrez

**Principal Investigator:**

Gary S Tompa

## Technology Maturity (TRL)

Start: **1**  
Current: **3**  
Estimated End: **3**



# Radiation-Tolerant Reprogrammable FPGA for Digital Signal Processing Circuits, Phase I

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## Technology Areas

### Primary:

- TX02 Flight Computing and Avionics
  - └ TX02.1 Avionics Component Technologies
    - └ TX02.1.5 High Performance Field Programmable Gate Arrays